

# Junior Space Rangers Activity Booklet

JUNIORS SPACE RANGERS (JSR's) are familiar with the Sun and the planets in our solar system, and the stars and the constellations beyond them. JSR's are also know some of the space-based methods and programs used to gather information about the space around us as well as our own Earth.

There are several ways to complete this JSR booklet:

- Observe the night sky on your own, either with or without binoculars or a telescope.
- Attend a ranger-led night sky program if you can.
- Go on the internet to a number of NASA\* websites. Several are listed below.
- Read about space in the encyclopedia or astronomy field guides.
- Take a trip to NASA Spaceflight Headquarters in Greenbelt, Maryland. Admission: FREE!

## Glossary:

Astronomy: the study of objects outside the earth's atmosphere

Orbit: the path of one object circling another

Galaxy: a cluster of a large number (billions) of stars

Satellite: an object that revolves around another object

Celestial: relating to the sky

Milky Way: our "home" galaxy

Light-year: the distance that light travels in 1 year (5.8 trillion miles)

\* NASA National Aeronautics & Space Administration

The **SOLAR SYSTEM** is made up of the sun and the planets (& their moons) orbiting around it.

The **SUN**



How large is the sun? (*diameter*) \_\_\_\_\_ miles

The Sun's surface temperature is \_\_\_\_\_ degrees F

The Sun is \_\_\_\_\_ miles

The Sun makes its own heat and light for the planets. How does it do that?

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Why are heat and light important to us on Earth?

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## PLANETS

"Planet" comes from the Greek word "to wander." Name the planets in the solar system

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and  
\_\_\_\_\_.

The largest planet \_\_\_\_\_.

The planet farthest from the sun \_\_\_\_\_.

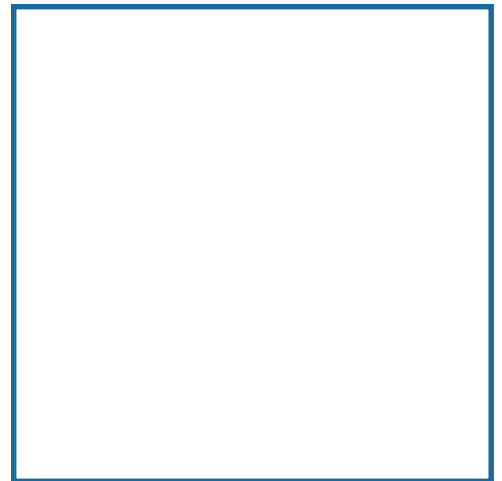
The "red" planet \_\_\_\_\_

Why does the "red" planet red?

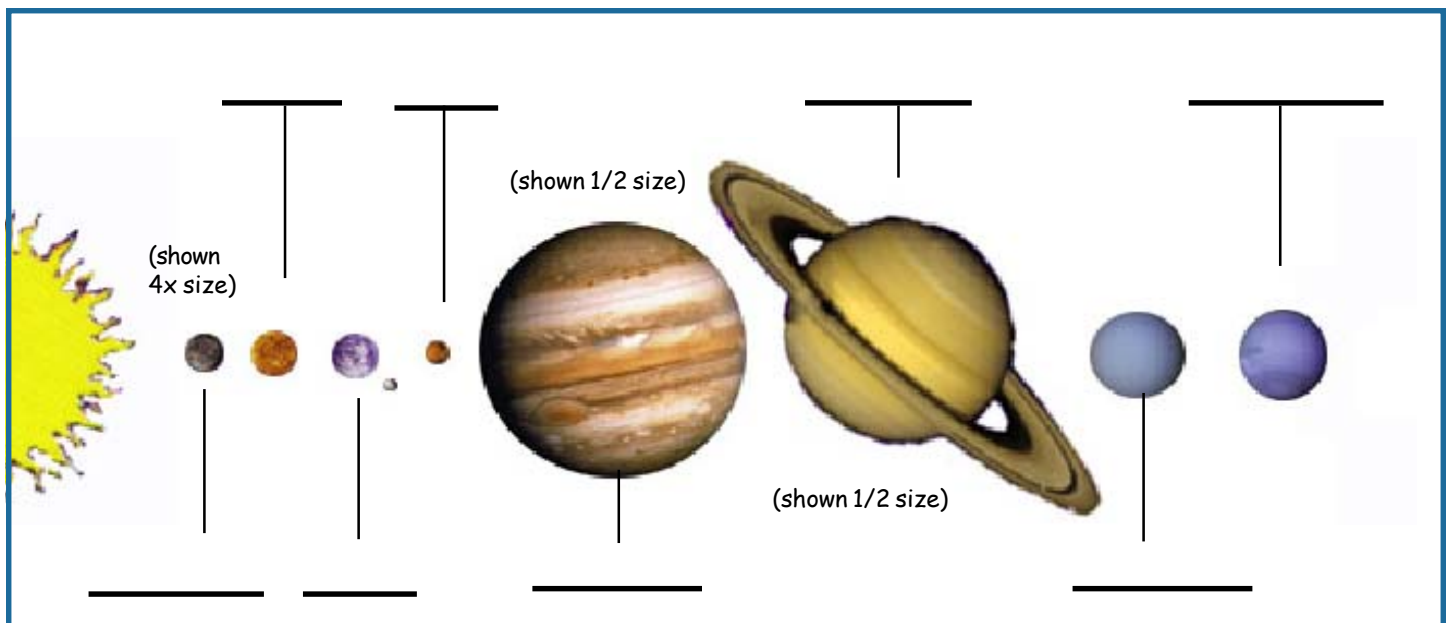
\_\_\_\_\_  
\_\_\_\_\_

Pick a planet, draw it, and write something you know about it:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Label the planets in their proper order from the sun.



THE **MOON** The Moon is the earth's only natural satellite.

Moon facts:

- The moon is about 1/4 the size of the Earth
- The same side of the moon always faces the earth.

Write something else you know about the moon.

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In the past, many people guessed what the moon looks like up close. Today, we have pictures of it and people have even been there!

Draw the moon and some of its features as we know it is .



What other natural and man-made objects are in the Solar System?

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**THE ZODIAC\*** is a group of 12 constellations equally spaced around the circle in the sky that the earth makes each year. When your birthday occurs, the sun rises and sets in one of those constellations. That is your zodiac "sign." People born under these signs are supposed to have traits and characteristics in common, like wisdom, humor, patience and understanding. The zodiac and its interpretation are another way that the stars can be interesting.

The 12 Constellations in the Zodiac are: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

"Zodiac" is Greek for "circle of animals." Eleven of the 12 zodiac constellations are creatures.

How else might stars be useful or interesting?

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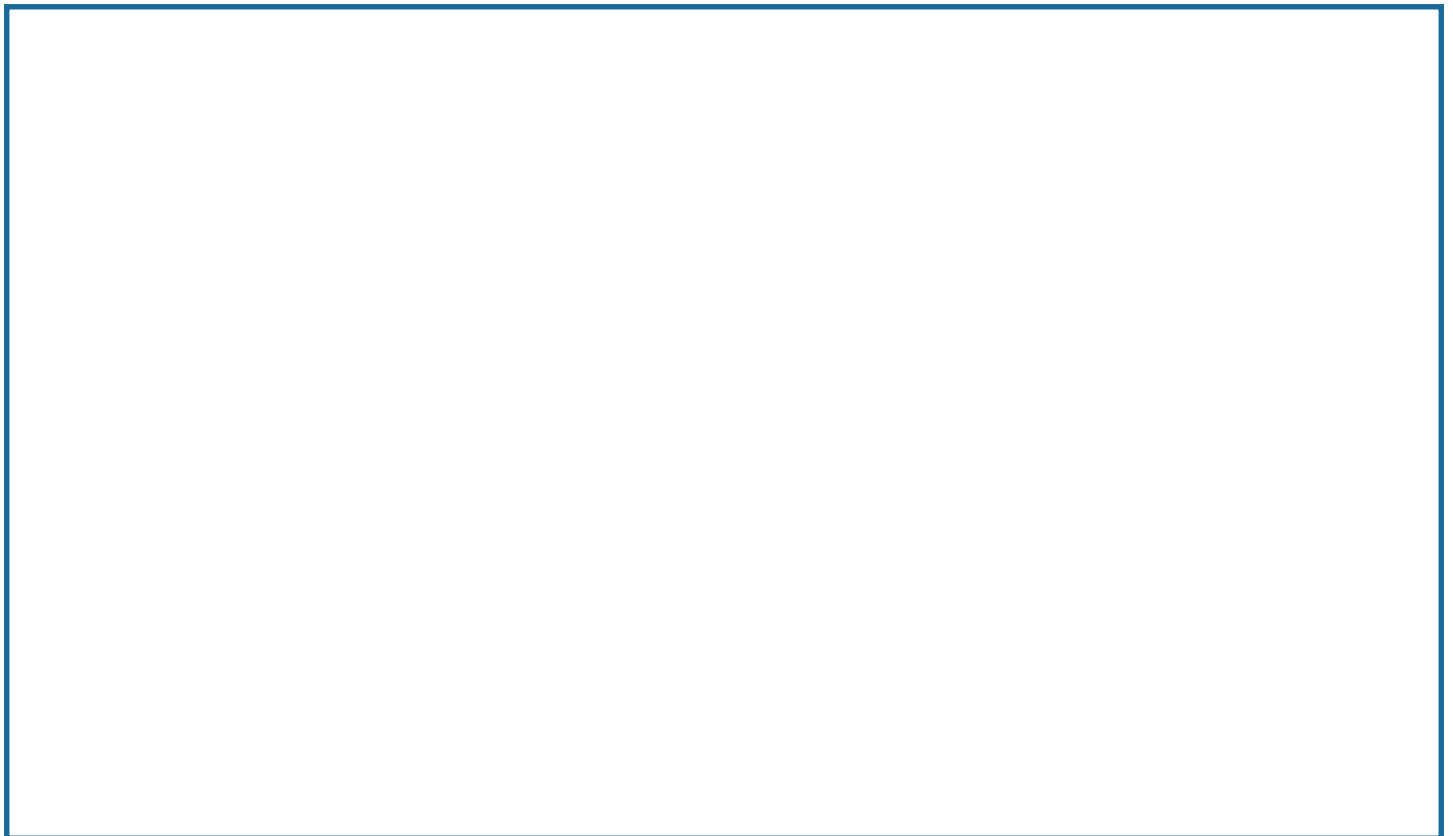
The night-sky and the objects in it have inspired artists, musicians, and writers as well as scientists. Name some art or music or stories or poems that use the night sky in their contents. Or, draw a picture, or make up your own poem!

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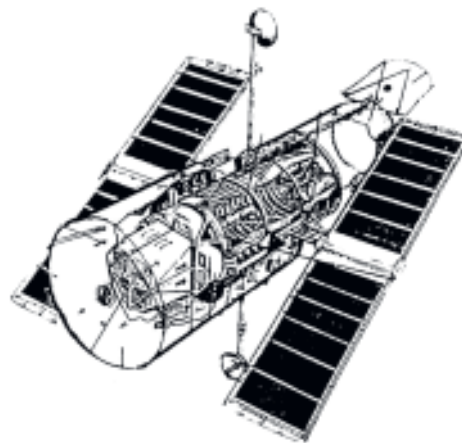
**ARTIFICIAL SATELLITES** measure and record for us all sorts of things ... in Space and on Earth. Some are listed below. Find out what they do.

Hubble Space Telescope

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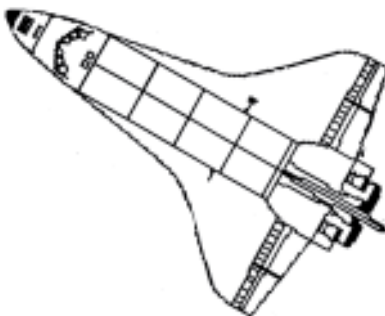
Space Shuttle

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JSR's are interested air quality ... the clearer the air, the better the skywatching. Several NASA satellites carry instruments that measure the Earth's atmosphere. CALIPSO, TERRA, and AQUA are but a few. Others "look" at oceans, and others, the land.

What do you think might be some of the things studied and measured by Earth satellites?

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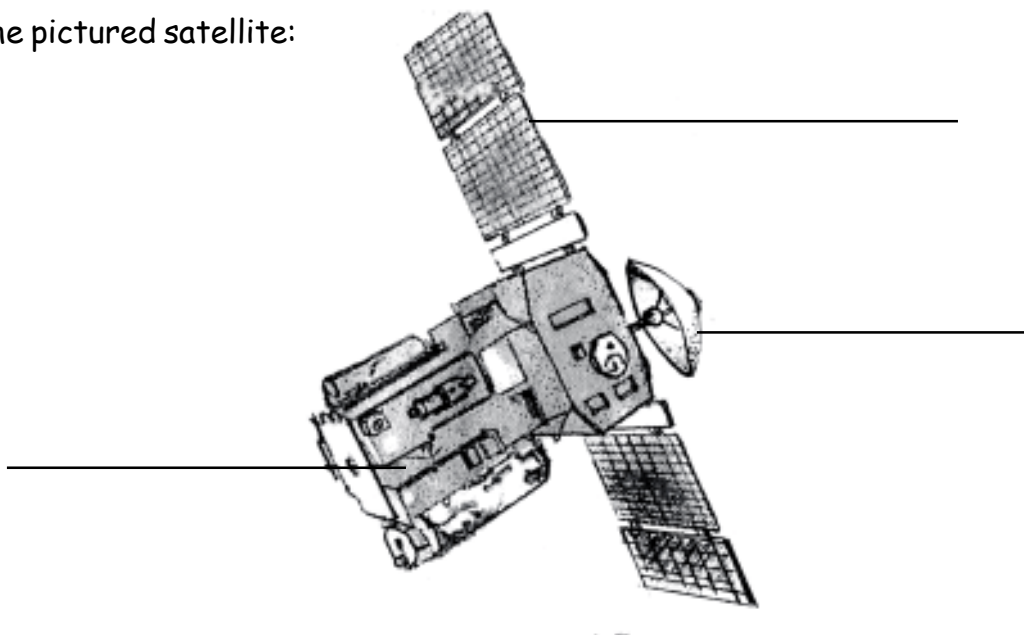
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Label the parts of the pictured satellite:

Solar panels

Instrument package

Antenna



Good -to-know web sites: [www.nasa.gov](http://www.nasa.gov) [www.visibleearth.nasa.gov](http://www.visibleearth.nasa.gov) [www.solarsystem.nasa.gov](http://www.solarsystem.nasa.gov)  
[www.mars.jpl.nasa.gov](http://www.mars.jpl.nasa.gov) [www.istp.gsfc.nasa.gov/istp/outreach/astron.html](http://www.istp.gsfc.nasa.gov/istp/outreach/astron.html)

Have fun!

**Deep Sky Objects (DSOs)** are *celestial* (sky-related) things that can exist *beyond our solar system*, like stars, comets, nebulae, pulsars, black holes, quasars, and other galaxies.

**Stars** are very large, very hot balls of gas that create their own heat and light, like our sun. ) These traits allow us to see them even though the nearest one is trillions of miles away.

**Constellations** are sky-pictures formed by connecting certain stars in the sky to each other with imaginary straight lines. The pictures -- people, animals & things -- are part of the myths and legends of earlier civilizations. Knowing the constellations and their stories makes stargazing more interesting. The best way to locate constellations is to start from a familiar point. The "Big Dipper" is easily recognized by most people. Then imagine a straight line that is 5 times the distance between the 2 stars that form the outer edge of the upper part of the Dipper and you will see the North Star, Polaris, which is the end of the handle of another constellation, the "**Little Dipper**." Between the two is the tail of "Draco, the Dragon."

On the star map, below, locate and connect the stars of the *Summer Triangle* and the constellation *Cassiopeia*. Using the stars with names as a guide, draw in another constellation that interests you. (You'll have to add in the stars you need.)

